International Ice Patrol Annual Conference Key Note Speech

The Finalisation of the Polar Code: the concerns and contribution of the insurance industry

Michael Kingston
Marine Trade & Energy Group, DWF LLP
michael.kingston@dwf.co.uk

International Ice Patrol Headquarters,
New London
Connecticut,
USA

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Good afternoon everyone. Thank you Commander McGrath for that very kind introduction.

It is an honour to be asked by International Ice Patrol and the United States Coastguard to give this talk today about the finalisation of the Polar Code, and I thank Commander McGrath and all the organisers for that invitation. It is truly an honour to be here, and I am acutely aware that the Patrol was established following the sinking of the Titanic. The Titanic's last stop was at Queenstown, now Cobh, in my home county of Cork, and the impact on my local community was significant at the time. Incredibly, just on Monday I did a talk at US Coastguard HQ on another massive disaster that is hugely connected to my home in Ireland, and of course, sank there with the loss of 1, 201 lives – the Lusitania. Of course these were enormously tragic events. They both have in common a simple concept, the failure to prepare – the 5 P's – Prior Preparation Prevents Poor Performance – the failure to adopt best practice, and the absence of regulation. Of course the International Ice Patrol is a product of that failure, and your work is incredibly important and has saved many lives. However, in ice we require stringent standards to be enshrined in law, and the practices of the Patrol with industry could be an invaluable education for other areas involving ice - and that is what I am here to talk about and discuss today.

The Polar Code is an important milestone in international regulation which will come into force in January 2017. I will briefly explain the history and main details of the Code, and hope to give an overview of the involvement of the Insurance industry in its development so that the concerns of the insurers in analysing ice operations can be understood.

Slide 2 - International Maritime Organisation (IMO)

I attended some of the deliberations at the International Maritime Organisation last year, and I have been representing the International Union of Marine Insurance (IUMI) on the world delegation Correspondence Group established after the safety aspects of the Polar Code were agreed at IMO Headquarters in November 2014,

working with the USCG. The Correspondence Group is charged with finalising the ice regime methodology to be applied by operators to demonstrate their limitation for operation in ice on their Polar Ship Certificate and detailed in their Polar Waters Operational Manual which are now required under the code.

I have also been working in parallel with the Arctic Council States and industry where we have been pushing proposals for best practice in the Arctic.

I hope to explain a bit about how the International Regulatory Process works and highlight how, as we have done in this instance, we can influence the process if we work together in an integrated approach.

The IMO Secretariat, require our help, as do national Governments. They cannot get it right without our help – and we must engage with them — in a concerted way- so that, as well as saving lives at sea, by encouraging best practice, we will be acting in our best interests, particularly in the insurance industry in London and elsewhere.

At the end of my talk I will reflect on some operations that are planned before this regulation comes into play and question whether they have really thought those through properly, particularly the planned voyage of the Crystal Serenity through the North West Passage next August.

Slide 3 - The Polar Code – Entry into force January 2017

The Polar Code is coming into force by way of an amendment to three existing Conventions.

The environmental aspects under the International Convention for the Prevention of Pollution from Ships, known as MARPOL; (1973 – entry into force 1983)

The crew certification aspects under the International Convention on Standards of Training, Certification and Watch keeping for Seafarers, 1978 known as STCW; and (entry into force 1984)

The safety aspects under the Safety of Life at Sea Convention, known as SOLAS 1974. (Adopted 1974 – entered into force May 1980)

SOLAS 1974 includes the tacit acceptance procedure - which provides that an amendment shall enter into force on a specified date unless, before that date, objections to the amendment are received from an agreed number of Parties.

Prior to SOLAS 1974, amendments required the ratification of new conventions – hence several versions of SOLAS prior to that.

MARPOL and STCW also These conventions include the 'tacit acceptance procedure' which allow the Committees of the IMO (consisting of the World delegations) to agree amendments which will automatically become law 12 months after a period of 6 months from adoption unless in that 6 month period more than one third of Parties, the combined merchant fleets of which constitute not less than 50% of the gross tonnage of the world's merchant shipping, have notified their objections to the amendments. This has never happened.

The reason why the Polar Code is not a standalone convention is that it was thought that it would, like so many other conventions take too long to ratify, although it was originally intended to be a standalone convention.

The SOLAS aspects of the Polar Code were agreed- and adopted at the 94th meeting of the Maritime Safety Committee in November 2014, where I participated with IUMI in the Working Group that finalised the Code.

The environmental aspects were agreed at the 67th Meeting of the Marine Environment Protection Committee in October 2014 and they will be formally adopted at MEPC68 next month. Following the 6 month period for appeal, and then the 12month mandatory period after that means that the agreed date for a harmonised introduction will be January 2017.

The Crew Training and Certification aspects were agreed at the Human Training and Watch keeping Committee in February 2015 and it is envisaged that States will adopt the crew training and Certification early – to co-incide i.e. in January 2017.

Slide 4 - Titanic Departed Southampton 10.04.1912
Sank off Newfoundland 15.04.1912

Unsinkable Titanic

A modern marvel of construction, the Titanic was the largest and most luxurious passenger vessel of its time. Thought to be unsinkable, the Titanic was equipped with eight watertight compartments on the hull of the boat that would close if water entered them allowing the Titanic to stay afloat. The sheer size and technological advancements present on the Titanic was the main reason why passengers and crew believed the ship to be unsinkable.

When I gave this talk in Lloyds' earlier in the year I chose the 10th April because it was the anniversary of the Titanic leaving Southampton, not on the 15th April the day she sank.

The world knew that day the folly of the approach to operational safety of the Titanic's voyage through ice infested waters, and her lack of safety in any event. But what was going on in the days and months prior to that are where we must learn lessons from history, and perhaps we have done – to an extent - where the Polar Code is concerned.

I said that – *"103 years ago today – if we were in the business of travelling to the United States, we would have boarded the Titanic in Southampton this morning to great fanfare and excitement. We would think that we were in the safe hands of operators who knew what they were doing"*

And I said that *"at this exact time we would be enjoying lunch in the dining rooms of the great ship a few hours out of Southampton heading towards Cherbourg, happy in the thought that the 'unsinkable' ship would get us to our destination so that we could go on about our business in the US"*

However, in reality, we were in a **pre-disaster phase**, where total disregard for safety would cause the loss of 1,517 lives resulting in the introduction of the first SOLAS Convention, and ultimately the development of the IMO itself.

I emphasise **pre-disaster phase**, because so often it is a disaster that raises the questions about the sense of some of the practices that lead to the disaster. So often we look back and realise that standards were incorrect, that common sense did not prevail, and that human beings and the consequences of their actions were allowed to play too large a part in those disasters.

Slide 5 Human Error – responsible for 75% of incidents

Indeed in modern times we need look no further than examples such as the Costa Concordia, or the South Korean Ferry Tragedy, and, the terrible Germanwings aviation tragedy in the Alps, where we have had to count the cost of allowing human beings and their potential weaknesses, to have too much influence in isolation in operations.

Human error will not go away, and research tells us, as concluded in the Lloyd's Wreck Removal Report, that over 75% of incidents are due to it.

Time and again the disaster tells us that best practice is not always adhered to, for a number of reasons, but often cost driven, and not until regulation comes into play following the disaster does industry adhere to best practice through regulation to prevent a re-occurrence. Unfortunately very often in the slow regulatory process, it takes another disaster to implement previously suggested regulation where industry continues to ignore recommendations. In the meantime those who do employ best practice in the same industry suffer the consequences.

That has been the realistic pattern in the development of international regulation. And History is littered with examples. I will mention a few:

Slide 6 - MV Betelgeuse, Bantry Bay, Ireland

This is the MV Betelgeuse which exploded in Bantry Bay, Ireland, in 1979 – when everyone, 50 people, died – resulting in the actual ratification of SOLAS 1974. Simple inert gas systems that had already been suggested but were not used on board the Betelgeuse became mandatory.

Slide 7 - Alexander L Kielland 1980, Norway

This is the Alexander Kielland disaster in Norwegian waters in 1980 – 123 people died resulting in a high level regulatory review in Norway.

Slide 8 - Piper Alpha, UK North Sea 1988

This is the Piper Alpha disaster in 1988 in the North Sea – 167 people died resulting in a High level regulatory review in the UK

Slide 9 - Deepwater Horizon 2010

And this is the Deepwater Horizon disaster in the Gulf of Mexico in 2010 – 11 people died resulting in a high level regulatory review in the US and worldwide.

Apart from atrocious and unnecessary loss of life, these disasters all have in common a lack of best practice at the time and correct regulation.

Slide 10 - Deep Water Horizon US Commission Report

In January 2011 the US National Commission Report into Deepwater Horizon stated that:

"This disaster was almost the inevitable result of years of industry and government complacency and lack of attention to safety."

This was later confirmed in the US Coast Guard Agencies report and it resulted in the decoupling of the regulator and the Health and Safety Executive, where, it stated, there was a clear conflict of interest, and a safety case approach to operations was recommended instead of a prescriptive approach.

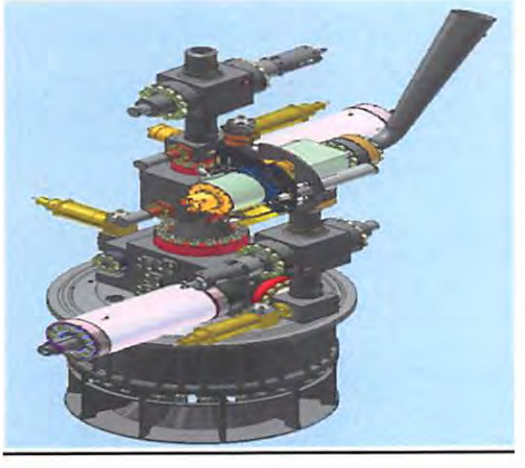
But these findings had all been seen before in Lord Cullen's report following the Piper Alpha disaster 22 years earlier, yet the lessons learnt in the UK were clearly not learned elsewhere.

The lessons to be learned from the Gulf of Mexico apply not just to deepwater drilling but to the industry as a whole on a global basis. And they also highlight the importance of proper regulation and the need to assist the international regulatory process.

Slide 11 - European Union – Hard at work

The Disaster prompted a review in the EU.

Slide 12 UK Review



OSPRAG
Capping Kit

And a review in the UK resulting in the development of the OSPRAG capping kit.

Many regulatory reviews have taken place across the world.

It is important to remember that most companies do operate using Best Practice, and rightly so. Much of the Best Practice has been promoted by guidelines issued by responsible organisations in the insurance industry such as the Nordic Association of Marine Insurers (CEFOR) or Lloyds Market Association (LMA). But what about operations outside the control of the Insured, but within the same industry? What about the rogue operator who goes off on a frolic of his own?

Slide 13 - Costa Concordia

What about the madness of a Costa Concordia. 32 people are dead and the cost to the industry is around the 2 billion dollar mark. Such incidents need to be prevented.

Slide 14 – Read me Please International Convention on Civil Liability for Oil Pollution Damage resulting from Exploration for and Exploitation of seabed Mineral Resources – in draft since 1977

The regulatory reviews in the energy industry showed us that regulatory regimes across the globe are fundamentally different in certain areas and are sometimes deeply flawed. Is that shocking?
Why is there such a disconnect in industry in terms of International law. Why is it that it often takes a disaster to promote change?

It is not shocking really when international conventions fail to be ratified, as those present from the IMO Secretariat are only too familiar with; where sensible agreed Conventions that the Secretariat have worked so hard on to finalise, have been lying on Government shelves for years without ratification.

Two very stark examples are the Torremolinos Convention for fishing boat safety – lying on Government shelves since 1977 – and only ratified by the Netherlands, Norway and Iceland, and the Convention for pollution from fixed structures, also adopted in 1977, and not yet ratified.

In the meantime thousands of lives have been lost in the fishing industry, and we have no international regulation surrounding pollution incidents such as the Deep Water Horizon Disaster.

It was clear to us all that of critical importance to what is required in the Polar Regions, and indeed elsewhere is proper planning based on a safety case approach.

So, in view of the failure to ratify conventions the effort taken to amend 3 Conventions to implement the Polar Code is a major step forward for the operation of vessels in Polar Waters, which it is hoped, whilst it does not cover all the aforementioned problems, will help prevent disaster if it is enforced, and encourage the correct behavioural atmosphere for best practice to prevail.

It is up to Governments and industry, and very importantly the insurance industry to educate everyone about its requirements to achieve that optimum result. That is why I am here today, and it is also important for me to explain the input of the insurance industry in its development because without that input the code ran the risk of being confusing and perhaps a recipe for disaster in such circumstances, thus demonstrating the importance of getting involved in, and assisting the international regulatory process.

Slide15 Polar Code –A Brief History

But first a brief history of the Code.

Operations in ice are not new and some companies and administrations have a vast amount of experience. Operators such as Canada's Fednav have been carrying out successful operations in the Canadian archipelago for the past 60 years. Another example is the Russian Company Sovcomflot. There are many more such as Stena Bulk, and Nordic Bulk Carriers from Denmark who took the first bulk Cargo vessel through the North West Passage in September 2013. Fednav would make history also in making the first unassisted transit in September 2014 with the Nunavik, pictured here in this slide. Both were insured here in London through P & I Clubs and the Lloyd's & Company Insurance market. Fednav's Head of Arctic operations, Tim Keane has been pivotal in helping develop the Polar Code as part of the Canadian IMO delegation.

Slide 16 - History of Ice Rules and Regulations

Going back a step or two, prior to these historic transits, regulations in Polar Waters developed over time as activity and capability developed, mainly on a national basis – save for the model diplomacy in the Baltic with the emergence of the Finnish – Swedish Rules. At the same time classification societies developed rules for ships on an individual basis.

Slide 17 - Finnish-Swedish System

- **First requirements for icebreaker escort 1890s**
- **"Percentage rules" in 1930's (increases over open water requirements for commercial vessels**
- **Rules for minimum engine power, strengthening of hull and machinery in 1971**
- **New rules for minimum engine power and hull structural design in 1985**
- **Various amendments over recent decades**

The current Baltic system integrates

commercial ship capability (ice strength and power),

icebreaker escort procedures

fairway fees (which help pay for the icebreakers)

These national systems are all somewhat different to each other. Known as 'ice regimes' here you will see the Finish –Swedish System – which integrates the ship's capability (both strength and power), ice breaker escort procedures, and also there is a fee structure –for the ice breaker escorts.

Slide 18 - Soviet/Russian system

- **Development of the Northern Sea Route under the Soviet system was "closed", but used extensively for northern development and military purposes**
- **Gorbachev's 1987 Murmansk declaration opened route (in principle)**
- **1990 Decree/1991 Regulations established basis for international navigation**
  - Ice class (strength and power)
  - Icebreaker escort (charged for)
  - Operator competency
  - Paperwork
- **To date, the very limited non-Russian traffic has essentially been demonstration voyages. The regulatory and tariff systems have been waived ("interpreted") for these.**

The Russian System developed over time and is administered by the Northern Sea Route Administration, keeping a tight control over operational safety, – which for long periods meant keeping a watchful eye over National military activities, but of late much more non-national traffic has passed through the Bering Strait on the Russian side.

Slide 19 - Canadian System

- The current Canadian system is based on the Arctic Waters Pollution Prevention Act, introduced after the pioneering voyage of the "Manhattan" opened the possibility of commercial traffic through the Canadian Arctic

- The overall system can be considered to be "risk-based", and includes
- Design standards
- Operational control measures
- Crewing requirements
- 2002 – introduction of the Arctic Ice Regime Shipping System (AIRS)

And then we get to the Canadian System. The Arctic Waters Pollution Prevention Act was introduced following the transit of the 115,000 ton oil tanker Manhattan through the North West Passage in 1969.

Canadian legislation in relation to safety and Oil Pollution is quite stringent and has been the bench mark for their delegation at the IMO to strive towards.

Canada operates the Arctic Ice regime Shipping System which asks operators to explain how their Ice Class vessel is going to deal with the expected conditions utilising ice charts and predictions in advance, and then requires that an Ice Navigator, who will either supplement the Master, or the Master may be a qualified ice navigator, to adhere to its guidelines in the actual ice conditions observed from the bridge during the voyage.

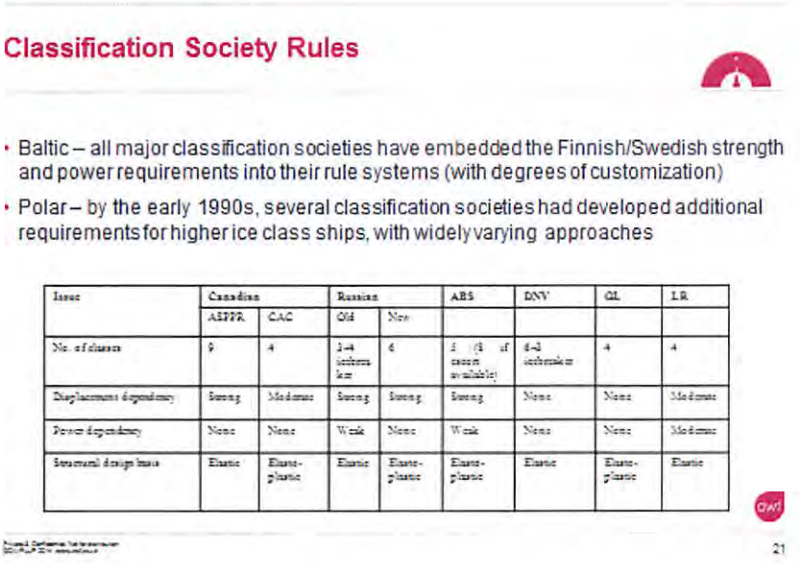
As we will see later, it was the lack of an Arctic 'ice regime system' that looked like it was going to undermine the Polar Code.

Slide 20 - Other National Systems

- Denmark imposes supplementary Port State controls for vessels travelling to Greenland, or operating in its coastal waters
- Norway has recently introduced ne ice pilotage requirements around Svalbard
- Of the Arctic Coastal States, the US and Iceland are alone in having no specific regulatory requirements for Arctic waters.

And there are some other National systems which are in their infancy and require further development.

Slide 21- Classification Society Rules



Classification Society Rules

- Baltic – all major classification societies have embedded the Finnish/Swedish strength and power requirements into their rule systems (with degrees of customization)
- Polar – by the early 1990s, several classification societies had developed additional requirements for higher ice class ships, with widely varying approaches

Issue	Canadian		Russian		ABS	DNV	GL	LR
	ASPPR	CAC	Old	New				
No. of classes	9	4	2-4 uniform ice	6	5 (6 if vessel available)	6-8 uniform ice	4	4
Displacement dependency	Strong	Moderate	Strong	Strong	Strong	None	None	Moderate
Power dependency	None	None	Weak	None	Weak	None	None	Moderate
Structural design basis	Elastic	Elastic-plastic	Elastic	Elastic-plastic	Elastic-plastic	Elastic	Elastic-plastic	Elastic

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All major classification societies have embedded the Finnish/Swedish strength and power requirements into their rule systems (with degrees of customization) for the Baltic.

But in relation to Polar waters as a whole– by the early 1990s, several classification societies had developed additional requirements for higher ice class ships, with widely varying approaches.

Slide 22 - 1990s – Harmonisation

The 1970s and 1980s saw dramatic increases in Polar shipping, and many ground breaking technological developments.

Knowledge gained, and the recognition of gaps in earlier rules and regulations led to the introduction/upgrading these national and class rules.

However, whilst these varying rules were developed for the most part on a national basis the Ice shipping world is not vast and much co-operation takes place between experts in operations and the research community from the varying jurisdictions in both the Arctic and Antarctic, even during the most difficult periods in mainstream relations with the old Soviet Union. Likewise today's problems in the Ukraine do not prevent full participation by Russia in a very constructive manner at both the IMO and the Arctic Council.

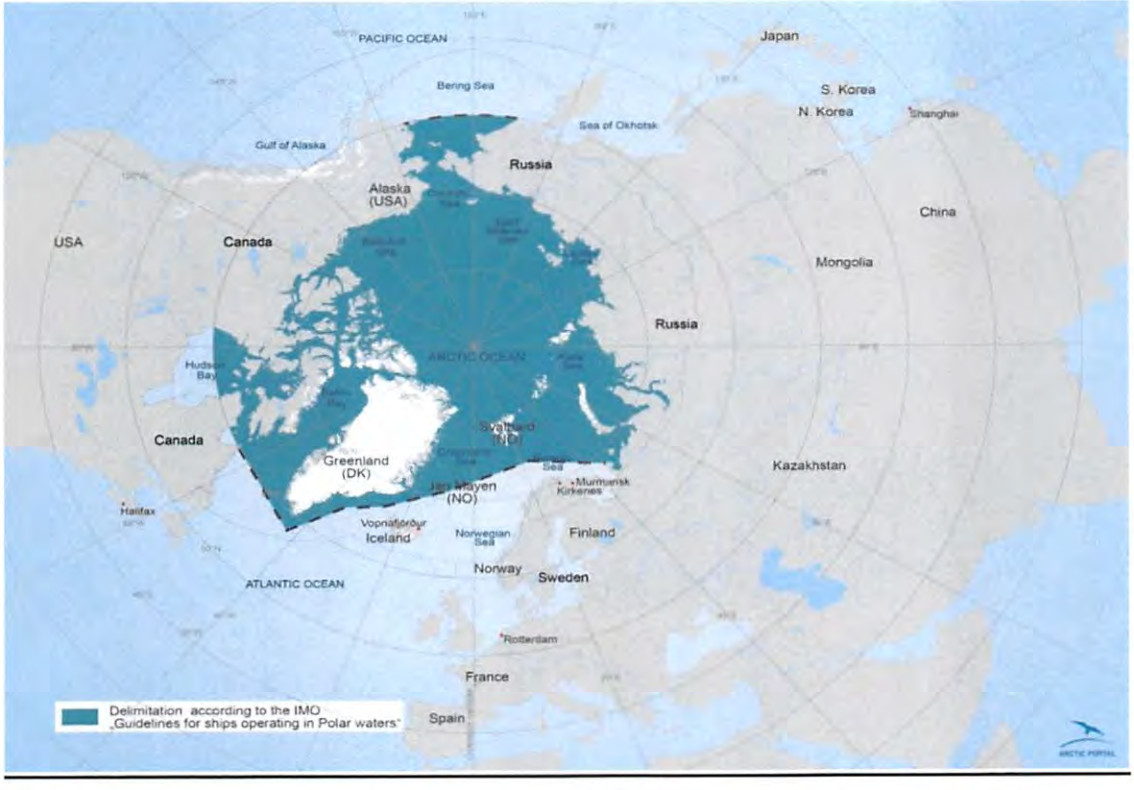
Several administrations made proposals to the IMO to develop a harmonized system of ice class rules and The IMO established a Working Group, under the DE Subcommittee (now the ship Design and Construction committee), to explore options and develop a way ahead. This was in effect the beginning of the 22 year process that would ultimately result in the agreed Polar Code at the end of 2014.

Slide 23 IMO Approach

The IMO Working Group drew on expertise from stakeholders and experts; including representatives from Class, ship-owners, and research organizations.

Consensus was reached early in the process to set up parallel groups with overlapping membership and meetings. The IMO would develop the overall framework for the initiative and
IACS would produce detailed requirements for construction-related items.

Slide 24 Delimitation, according to IMO Guidelines for Ships Operating in Polar Waters



Initially, the IMO group intended to produce a stand-alone Convention, including formalised requirements for ships in Arctic waters. Concerns over jurisdiction and other issues in the diplomatic process led to the final version becoming "Guidelines for Ships Operating in Arctic Ice Covered Waters" [MSC Circular 1056/MEPC Circular 399]

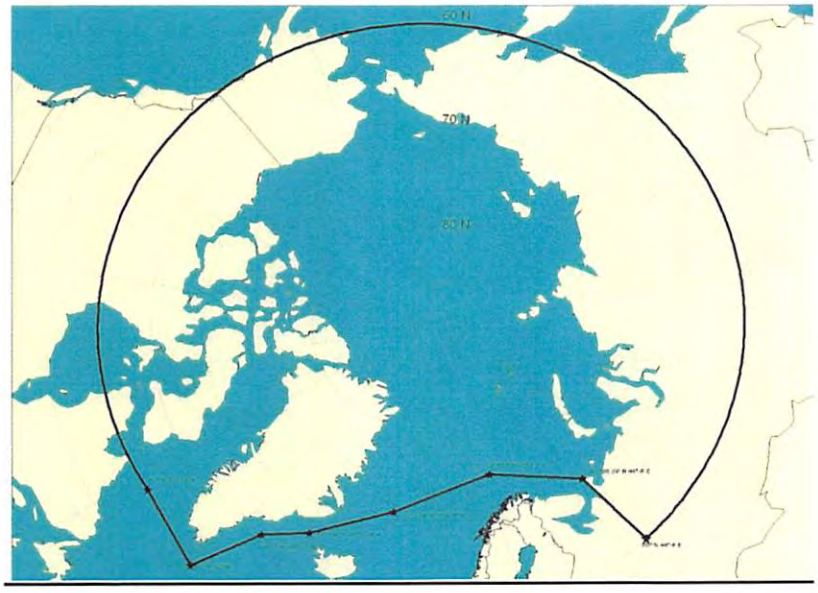
These Guidelines were agreed in 2002.

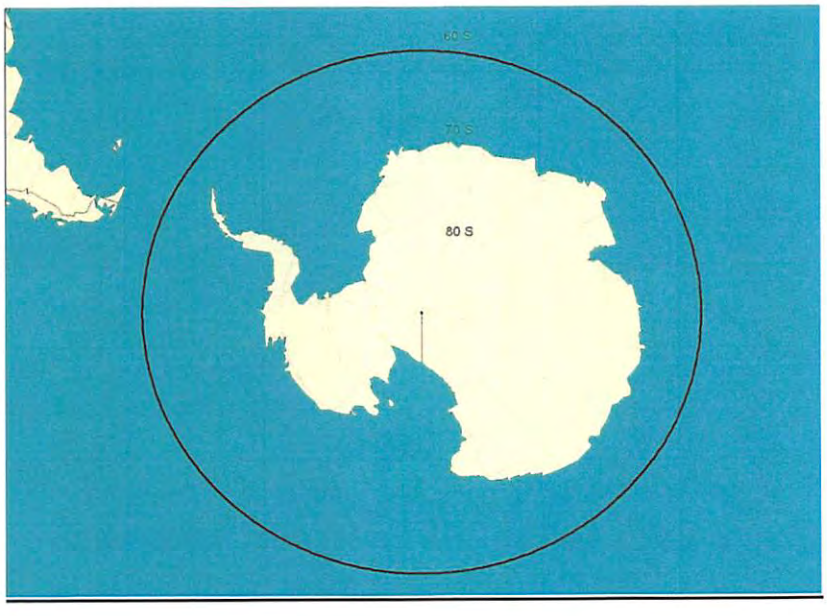
Slide 25 - Current Status

Then in May 2009 the IMO endorsed revisions to the 'Guidelines'

The new version was supported by all governments and by NGOs including Friends of the Earth and Ship-owners and operators.
Recommendations for stability, lifesaving and crew qualifications were strengthened
"Housekeeping" measures improved alignment with other IMO instruments.

Slide 26 – Polar Waters





The Guidelines were extending to all Polar Waters so as to include the Antarctic.

These guidelines were of course optional and non-obligatory.

Slide 27 – IMO Mandatory Polar Code – MV EXPLORER

I have explained how accidents prompt regulation and so the extension to the Antarctic was a result of the sinking of the cruise ship, Explorer, a near miss where she had proceeded into ice conditions without proper planning. It could have had tragic consequences were it not for the fact that two ships happened to be in the vicinity. There were other incidents too in the Arctic involving cruise vessels around this time. I think it is worth me showing you a video of the Explorer incident: (Slide 28)

Slide 29 - Mandatory Polar Code Time line

- A Correspondence Group was established at DE 53 in early 2010
- The CG report, and numerous other stakeholder submissions were submitted to IMO for consideration at DE 54 in October 2010
- DE 54, 55 and 56 Working Groups made further progress in developing the Code
- Chapters in the most advanced stages of drafting have been sent to other MSC Subcommittees for review
- A revised target has been set to have a final draft for IMO approval by 2014
- It is unclear how environmental issues will be incorporated into the Code, due in part to the heavy workload at MEPC. Canada, the US and the majority of Arctic Council states continue to press for more rapid progress.

This incident prompted the requirement for a mandatory Code. And so a Correspondence Group was established at IMO Design & Construction Committee meeting 'DE 53' in early 2010.
The Correspondence Group's report and numerous other stakeholder submissions were submitted to the IMO for consideration [at DE 54 in October 2010].

[At DE 54, 55 and 56] Working Groups made further progress in developing the Code and chapters in the most advanced stages of drafting were sent to other IMO Subcommittees for review. The target for approval of the final draft was 2014.

[It was not fully clear how exactly the Environmental issues would be incorporated, but as I have said; they will now be included as an amendment to the MARPOL Convention.

It is also important to point out that the Marine Environmental Protection Committee has had an extremely heavy workload.]

Canada, the US and the majority of Arctic Council States pressed for progress, and it is testament to those states that much work took place to meet deadlines. Also great work has been done by the Antarctic States, particularly Argentina. And indeed huge input by IACS, particularly their representative Rob Hindley of Lloyds Registers, and James Bond of the American Bureau of Shipping, both of whom I have had the pleasure of working with closely. I also have noted the extreme hard work of the Chairmen of the IMO Committees; directed and driven I might add by ladies – Turid Stemre of Norway, Marina Angsell of Sweden, and Dr Heike Deggim of the IMO Secretariat and her colleague Sandra Allnut, and I was delighted to see that it was the United States who recognised this and gave Turid Stemre a well-deserved award a few weeks ago.

Slide 30 - Overview of the Polar Code

The key principles for developing the Polar Code were a risk-based approach in determining scope and to adopt a holistic approach in mitigating all risks to acceptable levels.

The Code has Mandatory and Recommendatory parts.

An extensive list of hazards and risks has been developed and is being used to identify and validate risk mitigation measures.

Four main categories have been used to consolidate hazards and risks, which are:

The Environmental conditions (e.g. ice, temperatures)
The High latitude issues (e.g. remoteness, communications issues)
The Environmental sensitivity (e.g. slow recovery from damage)
And the Human element (e.g. specialised training and experience requirements, physiological effects of polar conditions)

Slide 31 Layout of the Polar Code

Part 1 – deals with the safety measures which will become new chapter XIV under SOLAS.

Part 1 also by way of Chapter 12 contains the training and crew certifications provisions which will be incorporated in the STCW Convention.

[Part 1 - A – comprises of 12 Chapters mandatory requirements]

Part 1 - B – contains guidance and recommendations

And, Part II – deals with Pollution Prevention Measures which will be incorporated under the MARPOL convention as Annexes I, II, IV and V dealing specifically with Oil, Noxious Liquids, Sewage, and Garbage.

Part II - A – comprises of 4 Chapters of mandatory requirements.

Part II - B – contains guidance and recommendations

Slide 32 - Part 1A: Chapters on Safety to be included in SOLAS

Introduction
1 General

2 Polar Waters Operational Manual
3 Ship Structure
4 Subdivision and Stability
5 Watertight and Weathertight Integrity
6 Machinery Installations
7 Fire Safety/Protection
8 Life-saving Appliances and Arrangements
9 Safety of Navigation
10 Communication
11 Voyage Planning
12 Manning and Training Familiarity (To be included in the STCW Convention)

Here are the Part 1A Chapters which you will see deal with all aspects of a ships operation in relation to safety.

Slide 33 Chapter 1 - General

Chapter one deals with General issues of Applicability, Definitions, Certificates and Surveys, and Performance standards. **Importantly it is a requirement that each Ship entering Polar Waters shall carry a Polar Ship Certificate.**

Slide 34 - Chapter 2 - Polar Waters Operational Manual (PWOM)

All ships in polar waters will be required to carry a PWOM in addition to their certificate.

•The goal of PWOM is to provide the owner, operator, master and crew with sufficient information regarding the ship's operational capabilities and limitations in order to support their decision-making process.

•PWOM is similar in concept to ISM documentation, but much more definition is provided regarding the required scope and contents

•However, at this stage there is no real "template" – no sample PWOMs have yet been produced.

Chapter 2 deals with the requirement for a Polar Waters Operational Manual – which in effect means that in the Manual the Operator has to demonstrate that they have catered for a worst case scenario 'in the conditions that may occur' in the planned voyage or 'operations' that the ship is intended for. That is something that I shall return to as it is not straight forward to do, or police, without proper systems and methodologies in place to assist – which is where the insurance industry is playing its part.

Slide 35 Chapters 3 – 6

Chapters 3 to 6 deal with the Construction of the vessel - largely relying on IACS Class Rules (or equivalent) and their place under Category A, B or C vessels. They deal also with:

Stability - very similar to current Guidelines;

Watertight integrity – winterization measures; and

Machinery – functionality under anticipated operational conditions; refers to IACS URs

Slide 36 Chapters 7 – 10

The next four chapters deal with:

Fire – aiming to ensure that systems function under expected environmental conditions (winterization);

Lifesaving – which aims to provide capabilities that can deal with environmental conditions, including abandonment onto ice where applicable, and give adequate endurance: "maximum expected time to rescue";

Navigational safety – which defines supplementary equipment to deal with high latitudes, plus winterization; and

Communications – supplementary requirements for ships and survival craft.

Slide 37 - Chapter 11: Voyage Planning

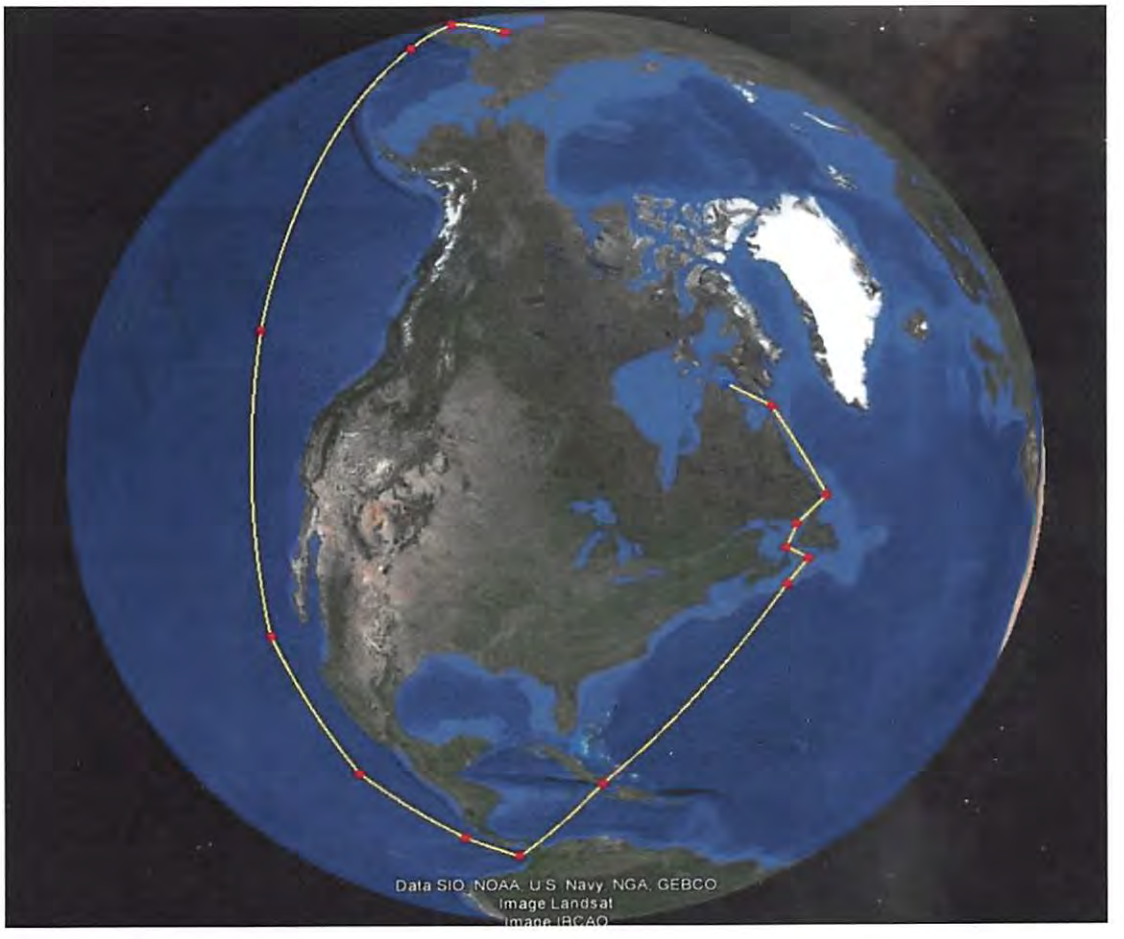
Chapter 11 deals with specific issues in relation to Voyage Planning to be included in the PWOM. The Code requires any voyage plan to consider specific issues related to both safety and all environmental impacts, including marine mammals etc.

The procedures required by the PWOM;

any limitations of the hydrographic information and aids to navigation available;
Current information on the extent and type of ice and icebergs in the vicinity of the intended route;
Statistical information on ice and temperatures from former years;
Places of refuge;
Current information and measures to be taken when marine mammals are encountered relating to known areas with densities of marine mammals including seasonal migration areas;
current information on relevant ships' routing systems, speed recommendations and vessel traffic services relating to known areas with densities of marine mammals including seasonal migration areas;
National and international designated protected areas along the route; and
Operation in areas remote from SAR capabilities

Very importantly operations in remote areas must deal with Search and Rescue capabilities.

Slide 38 - Nunavik - The Long way home- October 2014



Search and rescue is a critical issue which I will highlight. As we have seen from the Explorer incident it is of critical consideration in voyage planning. After the Nunavik went through the North West Passage in September 2014 I was actually with Tim Keane of Fednav when the decision was made not to send her back through in October. This is what Tim says:

"In terms of the return voyage of the NUNAVIK, this was the matter of much debate.

In short, when we made the westbound passage in September, there were still quite a few other ships in the north. Canadian Coast Guard Icebreakers maintain a presence until early October in the high Arctic, then gradually retreat ahead of the advancing ice cover so that by the beginning of November, the lights are out and everyone has gone home. This is likewise true of resupply ships and other commercial traffic.

So, by the time the NUNAVIK was ready to make the eastbound passage, the north of Canada was deserted. Even though we had utter confidence in the ability of the vessel to contend with ice conditions, the complete absence of any other support was the single largest consideration that led us to take the long way home. At midpoint of the NWP, in early November, we would have been about 1500 miles from the nearest other vessel, west or east"

Interesting stuff and a very sensible decision by Fednav it would appear.

Slide 39 - Chapter 12 - Crewing and Training – STCW

- New training requirements for "ice certification" will be incorporated in amendments to SCTW, and will involve two levels of competency. It is uncertain how quickly the necessary requirements can be put in place (agenda item for HTW 2).
- The number of and level of ice certified personnel is tailored to ice conditions and ship type.

Ice conditions	Tankers	Passenger ships	Other
Ice Free	Not applicable	Not applicable	Not applicable
Open waters	Basic training for master, chief mate and officers in charge of a navigational watch	Basic training for master, chief mate and officers in charge of a navigational watch	Not applicable
Other waters	Advanced training for master and chief mate. Basic training for officers in charge of a navigational watch	Advanced training for master and chief mate. Basic training for officers in charge of a navigational watch	Advanced training for master and chief mate. Basic training for officers in charge of a navigational watch.

- Note that «ice free» means exactly that, «open water» is up to 1/10th ice cover with no ice of land origin.
- The use of supernumerary ice navigators to supplement regular crews is not allowed by the current Code, but several countries including Canada and Russia are continuing to argue for this approach.

This Chapter deals with the new mandatory training requirements for "ice certification" which will be incorporated in the STCW Convention. [International Convention on Standards of Training, Certification and Watch keeping for Seafarers, 1978]

This Convention is very important in that it appoints Course Developers to develop courses that will implement the aims of IMO instruments by building model courses and an IMO Designated Representative is appointed to oversee the process. Additionally a Review Group is established which comprises of all stake holders – a bit like a Correspondence Group who look at the training model and refer the Course Developer's course to the Committee for validation of the course or referral back to the Course Developer for improvement id necessary.

In addition to the hard working Maritime Environmental Protection Committee, dealing with MARPOL amendments, and the Maritime Safety Committee dealing with the SOLAS amendments a further committee, the Human Element, Training and Watch keeping Committee (HTW) has been dealing with the STCW amendments. In particular I have been liaising with Captain Duke Snider from Canada, Vice President of the Nautical Institute, on these issues who is heavily involved on that Committee.

At the IMO's HTW meeting in February, details were finalised that will set the stage for amendments to the STCW Convention with respect to training and certification of deck officers and masters required under the Polar Code. Once approved, the amendments to Chapter V of STCW will include requirements for sea service, certification, revalidation, transitional provisions and minimum standards of training for deck officers and masters serving on vessels operating in polar waters. These details also need to be included in the Polar Waters Operational Manual.

If HTW recommendation for early adoption is accepted, entry into force of these STCW-related provisions could be moved forward to match that of the SOLAS and MARPOL provisions in January 2017 so some tricky management is required.

Under the new regime, deck officers and masters may be required to undergo training at either a basic or advanced level depending on the vessel, the ice conditions and their position. The STCW amendments will meet this requirement through a training and certification process.

The Basic Polar Waters Certificate of Proficiency will be issued to deck officers after successful completion of an approved basic course and proof of meeting the standard of competence specified in section A-V/4 of STCW. No sea service is required to obtain the Basic Certificate of Proficiency.

To obtain the Advanced Polar Waters Certificate of Proficiency, the officer must have previously met the requirements for certification in basic training in polar waters, then obtained at least two months approved seagoing service in the deck department at management level or while watch keeping in an operational level within polar waters or approved equivalent seagoing service, AND have completed approved advanced training and met the standards of competence specified in section A-V/4 of STCW.

In line with STCW 1/11 requirements for other certificates of proficiency, both of these certificates will require revalidation every five years.

There will be a transitional period as the new requirements gradually come into force, and allowance will be made for deck officers and masters to obtain interim certificates of proficiency that will be permitted until two years after entry into force.

In order to obtain a Basic Certificate of Proficiency, a seafarer holding a current STCW Certificate of Competency must have completed sea service of three months in the preceding five years in polar waters or approved equivalent seagoing service, or attended a training course meeting training guidance provided in Section B-V/g of STCW.

To obtain an Advanced Certificate of Proficiency, a senior deck officer or master with a current STCW Certificate of Competency must have commenced approved sea service in polar waters PRIOR to [the date of entry into force] and shall establish that they meet the competency requirements by having completed at least three months sea service at a management level in the previous five years in polar waters or approved equivalent seagoing service; OR having attended a training course AND completed two months sea service in polar waters or approved equivalent seagoing service.

And Tables have been finalised outlining the minimum standards of training and competency that must be met for both the basic and advanced levels. These tables will form the basis of the model courses that will be developed in the coming months.

Slide 40 - Part 1B – Guidance

Part 1B provide Guidance for aspects of Part 1 A [Chapters 1, 2, 3, 8, 9, 10 and 11] and introduces many key concepts, including interpretation of temperature requirements, assignment of operational limitations, general contents for PWOM's, and equivalencies for existing (and new) ships.

These Guidelines are extremely important and it is in respect of operational limitation that the correspondence group has been set up to continue to develop better guidelines for operational limits based on practical applications as we move forward. I will return to this in a moment.

Slide 41 - Part 2A – The Environmental Chapters - the MARPOL Amendments

Part II A of the Code deals with the environmental obligations – the MARPOL amendments.

Slide 42 - Chapters 1, 2 - ZERO DISCHARGE

Chapters 1 & 2 provide for zero-discharge of oil, oily mixtures, and Noxious Liquid Substances;

And additional double-hulling measures in tanks for new Category A and B ships.

Slide 43 - Chapters 4, 5

Chapters 4 & 5 impose additional sewage discharge requirements near land and ice; and

Additional prohibitions on the discharge of garbage and cargo residues near land and ice.

Slide 44 - Part 2B – Guidance

Part 2B provides guidance in respect of Part 2A. Very little addition material is provided but there is some guidance for example on the selection of stern tube lubricants, and the application of ballast water treatment and anti-fouling measures for the prevention of transfer of invasive aquatic species.

Slide 45 - Some Key Concepts to Understand - particularly focusing on the safety aspects of the Polar Code.

The key concepts in all this to focus on in the Code are:

Polar Ship Categories;

Polar Service Temperature;

PWOM contents (which also of course deals with Environmental aspects); and

Operation Limitation on Polar Ship Certificates – the POLARIS 'ice regime' methodology- which I will get to shortly.

Slide 46 - Polar Ship Categories

The Polar Ship Categories provide thresholds for various requirements, and are divided into Category A, B & C vessels with definitions of what ice they can deal with.

Category A ship means ships designed for operation in polar waters at least in medium first-year ice, which may include old ice inclusions;

A Category B ship means a ship not included in Category A, designed for operation in polar waters in at least thin first-year ice, which may include old ice inclusions; and

Category C ship means a ship designed to operate in open water or in ice conditions less severe than those included in Categories A and B.

[Category A ships shall be ice strengthened and the scantling of the ship shall be approved by the Administration, or a recognized organization accepted by it, taking into account standards acceptable to the Organization2 or other standards offering an equivalent level of safety.

Category B ships shall be ice strengthened and the scantling of the ship shall be approved by the Administration, or a recognized organization accepted by it, taking into account standards acceptable to the Organization3 or other standards offering an equivalent level of safety.

Category C ships shall be ice strengthened and the scantling of the ship shall be approved by the Administration, or a recognized organization accepted by it, taking into account acceptable standards adequate for the ice types and the concentrations encountered in the area of operation.

Category C ships need not be Ice Strengthened if, in the opinion of the Administration, the ships structure is adequate for its intended operation Refer to Polar Class 1-5 of IACS Unified requirements for Polar Ships (UR I (2011))
Refer to Polar Class 6-7 of IACS Unified requirements for Polar Ships (UR I (2011))
Refer to Polar Class 6-7 of IACS Unified requirements for Polar Ships (UR I (2011))

Slide 47 - IACS Polar Class Rules – Interpretation

- IMO Category
- A = IACS PC 1-5
- B = IACS PC6 – 7
- C = Baltic 1A Super – 1A & Non Ice Class

Polar Class	Ice Description (based on WMO Sea Ice Nomenclature)
PC 1	Year-round operation in all Polar waters
PC 2	Year-round operation in moderate multi year ice conditions
PC 3	Year-round operation in second-year ice which may include multi-year ice inclusions
PC 4	Year-round operation in thick first-year ice which may include old ice inclusions
PC 5	Year-round operation in medium first-year ice which may include old ice inclusions
PC 6	Summer/autumn operation in medium first year ice which may include old ice inclusions
PC 7	Summer/autumn operation in thin first-year ice which may include old ice inclusions

Categories are linked to ice classes; in particular those under the IACS Unified Requirements for Polar ships.

Slide 48 - Polar Service Temperature

A ship intended to operate in low air temperature means a ship which is intended to undertake voyages to or through areas where the lowest Mean Daily Low Temperature (MDLT) is below - 10C. The Polar Service Temperature (PST) specified for the ship has to be set at least 10C below the lowest Mean Daily Low Temperature for the intended area and season of operation in polar waters.

This difference is roughly equivalent to accepting a 2.5% probability (2 standard deviations) that a lower temperature will be encountered at some point.
Safety-related equipment will need to be tested to show full functionality at the design temperature (or lower).
Operational procedures can be used to manage risk if extreme low temperatures are encountered.
This approach is not what is used in any current classification society Winterization rules; which all have significant differences in requirements.

Slide 49 - Contents of PWOM

- operation in ice, as applicable;
- operation in low air temperatures, as applicable;
- communication and navigation capabilities in high latitudes;
- voyage duration;
- voyage planning to avoid ice and/or temperatures that exceed the ship's design capabilities or limitations;
- arrangements for receiving forecasts of the environmental conditions;
- means of addressing any limitations of the hydrographic, meteorological and navigational information available;
- operation of equipment required under other chapters of this Code;
- implementation of special measures to maintain equipment and system functionality under low temperatures, topside icing and the presence of sea ice, as applicable.
- (procedures for) contacting emergency response providers for salvage, SAR, spill response, etc. as applicable;
- in the case of ships intending to operate in ice, procedures for maintaining life support and ship integrity in the event of prolonged entrapment by ice.
- measures to be taken in the event of encountering ice and/or temperatures which exceed the ships design capabilities or limitations.

I have already mentioned that Chapter 2 deals with the requirement for a Polar Waters Operational Manual – which in effect means that in the Manual the Operator has to demonstrate that they have catered for a worst case scenario 'in the conditions that may occur' in the planned voyage or 'operations' that the ship is intended for.

Now this all sounds great, but there was one fundamental problem with the draft Polar Code going back a year or thereabouts which the insurance industry, and indeed many of those working on the Polar Code found difficult to understand, which would have created huge problems for the operationalising of the Code.

There was a good description as we have seen of Polar Ice Class and indeed harmonisation of Ice Class, and what type of ice the particular ship can withstand and operate in.

BUT for preparations in advance and actual operations there was no guidance to link the likely conditions that may be encountered in the area the ship is intending to operate in and how to therefore determine operational limitations for the actual ship in question. How can you complete your Polar Waters Operational Manual without this guidance, or obtain a Polar Ship Certificate confirming that the operational limitation method has been applied when there was no method to consider?

Slide 50 – Pictures of Lloyd's

LLOYD'S

This is where the insurance industry started to play their part in the development of the Polar Code.

Having been involved in the Lloyd's 2012 Arctic Report I found myself working with the Swedish Government on Arctic Council matters and with industry put together a draft Declaration of Standards called the Arctic Marine Best Practice Declaration, in an attempt to get industry to lead from the front in view of the absence of a mandatory Polar Code and indeed oil pollution regulation.

Slide 51 – Presidents Workshop – International Union of Marine Insurers World Conference. London. 18.09.2013.

I worked on this project with Ake Rohlén of Artic Marine Solutions and 75 year old Captain Anders Backman who was the Master of the ODEN taking her through the North Pole on a number of occasions. This Declaration was put through industry consultation and was backed by IUMI and I found myself with Ambassador Gustaf Lind and Ake Rohlén doing the closing talk at the IUMI world Conference in 2013. At this stage Canada had taken over the Chairmanship of the Arctic Council, and following a meeting in London with Canadian Minister for Transport Lisa Wrait in January 2013 with the Insurance Industry, and some further discussions with Brad Spence and his colleagues in Transport Canada, and liaisons with Patrick Borbey, Canada's Senior Arctic Ambassador, I found myself, in conjunction with Transport Canada, doing a presentation at the IMO at their Arctic focus Day in February 2014, working closely with Lars Lange, Secretary General of IUMI and CEO of the Nordic Association of Marine Insurers and Chairman of IUMI's Political Forum, Helle Hammer, by now representing the world's marine and energy insurance industry on the issue.

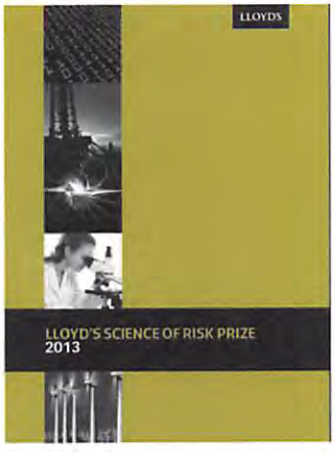
Slide 52 - Ambassador Gustaf Lind of Sweden, Chairman of Senior Arctic Ambassadors, Lloyd's September 2012 with Judy Knights

But as you can see all this started with work here in this building, where I received a lot of help from leading insurers and commend the leadership of Lloyd's through Tom Bolt and his Performance Management team, Judy Knights seen here in this picture was instrumental, the LMA through Neil Roberts, the Joint Hull Committee through Mark Edmondson and Peter Townsend, the Joint Liability Committee through Philip Sandle, and the Navigational Limits Subcommittee through Mike Thompson. David Lawrence, Kevin Clarke and Mark Patterson of Lloyd's Agency, and Erik Börjesson – Lloyd's Representative for Scandinavia, and others too in the Company Market such as Paul O Neil of Allianz, and Andrew Teasdale of RSA, amongst others, and young market participants also made enthusiastic and valuable contributions- the Lloyd's Graduates and people like Thomas Upton of Hiscox, Caroline Mathews of Accapella, and John Marsden of Accenture

Here I am seen with Ambassador Gustaf Lind of Sweden by the famous Lutine Bell. The lesson to be learnt from this slide is

Always carry some files around to make yourself look busy!!

Slide 53 – Lloyd's Science of risk Prize



At the IMO, we discussed the importance of insurance as a key component in Arctic operations, not just in the industry's suggestions to reduce risk, but that the concerns that it raises may serve to exclude certain safe operations as un-insurable due to confusion.

We explained how the insurance industry, in its analysis of risk employs scientists, mathematicians and actuaries with various specialisms depending on the type of markets the insurers are specialising in, and how Lloyds' as an insurance market supports many businesses across the world in all types of specialised sectors, with a heavy emphasis on new and emerging sectors, but that certain matters needed to be taken on board when doing so.

We explained that Lloyd's Emerging Risk Team is dedicated to looking at new issues of concern that arise in the insurance world or new frontiers such as the Arctic.

And how for example the team runs a competition each year called the Lloyd's Science of Risk Awards and frequently prepares reports working with leading industry experts in an attempt to reduce the parameters of risk. The importance Insurers place on research cannot be over emphasised.

Slide 54 Executive Summary of Lloyd's Arctic Report

Rapid and Disruptive Change presents uneven prospects
Arctic likely to attract potential $100BN investment
Significant knowledge gaps
Arctic conditions remain challenging and unpredictable
Environmental consequences of disasters likely to be worse than other regions
Politics of Arctic economic development controversial and fluid
Continued development of Governance frameworks with reinforcements where possible
Risk Management is fundamental

And we explained how, in order to analyse risk in the Arctic, Lloyd's Emerging Risk Team decided to commission an Arctic Report and explained the main points in the Executive Summary. I don't have time here today to go into the report in detail. Of particular relevance to the operationalising of the Polar Code were the points highlighted in blue.

About Significant knowledge gaps

Charting data is obviously an issue for mariners, and together with ice data are the critical issues for companies hoping to operate and ship assets and cargo;

The Environmental consequences of disasters are likely to be worse than other regions;

In the absence of knowledge incidents will occur. The potential environmental consequences, difficulty and cost of clean-up may be significantly greater, with implications for governments, businesses and the insurance industry. Trans border risks, covering several jurisdictions, add further complications;

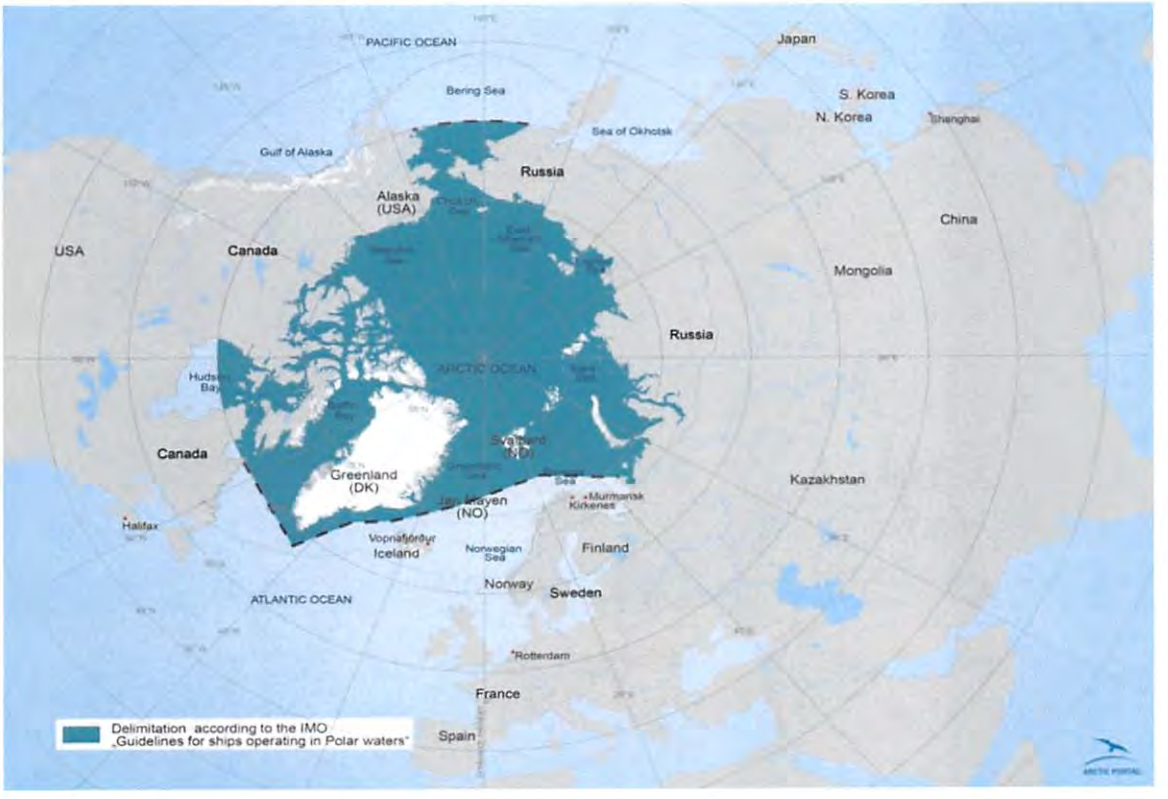
The importance of Continued development of Governance frameworks with reinforcements where possible;

There are major differences between regulatory regimes, standards and governance capacity across the Arctic states. The challenges of Arctic development demand coordinated responses where viable, common standards where possible, transparency and best practice across the north. These frameworks need to be in place to enable sustainable development and uphold the public interest; and

That Risk Management is fundamental, where the Insurance industry would like to see Companies operating in the Arctic implement robust risk management frameworks and processes that adopt best practice and contain worst case scenarios, crisis response plans and full-scale exercises. [There are many practical steps businesses can take to manage risks effectively, including investing in Arctic-specific technologies and implementing best-in-class operational and safety standards.

We explained that the Polar Code is a major step forward in filling this gap for insurers; but the code needed to be fit for purpose, with clear guidelines.

Slide 55 - Delimitation, according to IMO Guidelines for Ships Operating in Polar Waters



We discussed the Navigational Limits provisions of Hull & Machinery policies – [that is the insurance of the property of the vessel and its equipment] - how they require the operator to inform the underwriter if they are going above 70 N.

The current concerns are obvious:

- Extreme cold [can cause engine problems and make it difficult or impossible for equipment to work]
- There is reduced coverage by navigation aids such as GPS.
- Inaccurate charts and magnetic compasses are unreliable in such high latitudes
- There is restricted visibility up to 90% of the time
- Inadequate weather reports and violent storms can occur at any time.
- And Salvage facilities are almost non-existent.

Slide 56 - Wreck Removal – The Costa Concordia

Turning to Protection and Indemnity cover,- that is the insurance for the consequences to third parties of something happening to the vessel- which is insured in first instance by Protection and Indemnity Clubs of which the vessel owner will be a member to spread the sometimes enormous liability – for instances such as the Costa Concordia- we explained that although P&I Clubs do not generally impose navigation limits, the Club rules require them to be consulted if a voyage does not fall within a vessel's normal trading pattern. Of course Polar Waters are not a normal trading pattern for most operators.

Slide 57 - Global Location of Equipment

Figure 4: Principal base location of heavy lifting gear

We discussed the Lloyd's Wreck Removal Report highlighting the difficulty in affecting a rescue or removal in the Polar Waters. Additionally crew injury and hospitalisation is an issue due to remoteness; and

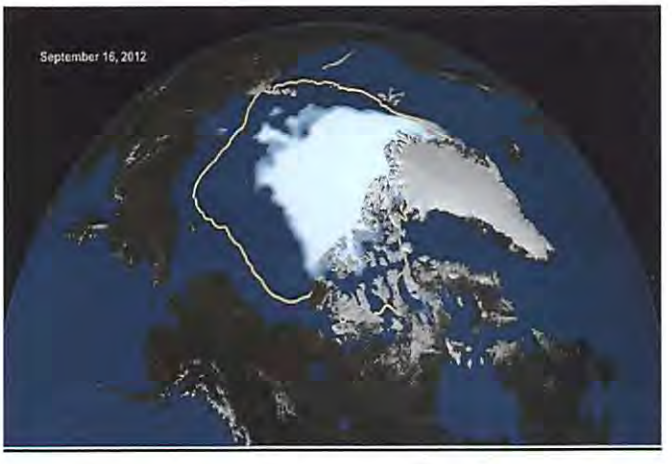
Oil pollution presents huge problems.

Although a search and rescue agreement has been signed by the Arctic States not a huge amount of progress has been made. Much work remains to be done on a practical level. Russia has made some progress in relation to location of equipment along the Northern Sea Route area.

[In May of last year I was involved with Lloyd's in helping with an industry discussion at the British Embassy in Oslo in relation to drilling at 72.3 N in the Barents Sea. As operations approach the ice edge there are unknown's that need to be catered for and ice management becomes the key issue. This as Ake Rohlén puts is represents a 'paradigm shift' in conditions as we creep further north around the ice edge. Critical to ice management is information about wave patterns and also ice data. You cannot cater for a worse case scenario if you do not know what the conditions are, or what they are going to be over a sustained period, depending on how long you predict your operations are going to take place. Certain operations outside transit operations in the exploration world could be over a period of 25 or 30 years. In those circumstances you have to look back at the environmental data over the last 30 years and try and predict what is going to happen in the next 30 years in order to try and determine what the worst case scenario is.]

It is also important to note that melting ice does not necessarily mean easier operations. It fact it can create more difficulty because there is more uncertainty. For example, where you have what is known as clear water can be danger as there can be significant lumps of ice floating around in the 'clear water' which can be unpredictable and can cause major problems for operations.]

Slide 58 - September 9th 2012 – Arctic Sea Ice Hits Smallest Extent In Satellite Era (Photo Courtesy of NASA)



On 09 September 2012 Arctic Sea Ice hit its smallest extent in the satellite era, and just a few months prior to the IMO meeting there had been an increase in activity. The transits of the Northern Sea Route showed an increase from 4 transits in 2010 to 71 in the 2013 season, including the historic Nordic Orion transit, and more operations were taking place in unchartered areas.

Slide 59 Cruise Ship off the Greenland Coast

And coupled with the increase in activity there had been some further near misses. This is a good example with a potential for catastrophic consequences - a cruise ship without ice class and lots of people on board off the coast of Greenland.

We explained that this is a nightmare for insurers and such incidents do not inspire confidence within the insurance industry, and that clear regulation is required.

Slide 60 - Nordvik – Northern Sea Route 2013

Barents Observer

Tanker accident on Northern Sea Route

A tanker loaded with diesel fuel was holed by an ice floe on the Northern Sea Route and suffered ingress of water. There are no reports on any oil leakage and the tanker is now slowly sailing towards Murmansk.

Additionally in September 2013 the Nordvic entered ice waters and punctured her hull while transiting the Northern Sea Route.

She was not prepared for the ice conditions that were in play at the time, and it could have been an enormous environmental catastrophe. She had to affect a ship to ship transfer and limp back to Murmansk

Slide 61 – The Akademik Shokalskiy – Antarctic January 2014






And of course we had the well documented problem in the Antarctic in January 2014 with the Akademik Shokalskiy. It was no laughing matter for the Australian Maritime Authorities who, reportedly, incurred a $1.6 million bill. That rescue also involved a USA Ice Breaker and a Chinese Ice Breaker at substantial cost.

Slide 62 – An Arctic Ice Regime System

Polar Class	Ice Description (based on WMO Sea Ice Nomenclature)
PC 1	Year-round operation in all Polar waters
PC 2	Year-round operation in moderate multi year ice conditions
PC 3	Year-round operation in second-year ice which may include multi-year ice inclusions
PC 4	Year-round operation in thick first-year ice which may include old ice inclusions
PC 5	Year-round operation in medium first-year ice which may include old ice inclusions
PC 6	Summer/autumn operation in medium first year ice which may include old ice inclusions
PC 7	Summer/autumn operation in thin first-year ice which may include old ice inclusions

How can these be applied to a real Operation?

Where can a vessel operate?

When can it operate?

At the IMO we focused in particular on our understanding of the requirement for a Polar Ship Certificate and a Polar Waters Operations Manual, the combination of which, we said we understood, was to give guidance for a range of planned and possible situations.

But we expressed our concern that it is left very much up to the Owner, subject to satisfying the Flag State, that the content is appropriate.

We explained that there may not be a problem if a Flag State has an understanding of ice. But, if the benchmarked rules in the Polar Code are not clear, what if that is not the case and how will it be enforced by Arctic States that have no developed ice regime. We explained that on an Arctic and indeed Polar wide basis and in international waters this was an issue of concern and that there was a knowledge gap that we could not get away from which made it difficult for insurers to agree to operations above 70 degrees north.

We explained that the IAACs Polar class rules tell you what type of ship is needed for what type of ice but no guidance was given about interpreting ice in different geographical areas.

So, one of the main issues of concern was that there was no ice regime system applied to the whole Arctic or Antarctic areas, the absence of which would make it very difficult to complete the Polar Waters Operating Manual. If you cannot determine the extremities of what ice conditions are at play in the area of the intended voyage or operation you cannot determine what other requirements are going to be necessary, or even the type of ship required. Everything flows from the encountered ice regime to determine the worst case scenario that needs to be planned for in the conditions that, as the Polar Code says, 'may be encountered'.

As we have seen, Canada operates an ice regime system with zones and ice classes depending on ice conditions. Russia also has a system of ice regime that has some principal similarities with the Canadian system. Sweden and Finland operate a Baltic system, but this is not applicable to the Polar Waters.

However, the USA, Norway, Denmark/Greenland and Iceland all lack full ice regime systems, Iceland and the USA having none at all. And the problem is even more acute in the Antarctic. We argued that an ice regime system should be established in order to have an effective application of the Polar Code, a single ice regime system in the whole Arctic and Antarctic enabling a universal application and understanding of the rules. In order for the Polar Ship Certificate and Polar Waters Operation Manual to make sense we argued that is essential

Slide 63 – Insurers attitude at present to insuring above 70^0N

Otherwise, we explained, insurers' automatic default at present was to turn risk away, and that this is impacting on operators who are operating with best practice.

Slide 64 - So what could we do about this to make it work?

So what could we actively do about all of this to help the IMO as an industry?

It was clear that in order to make relevance to the Polar Code and reduce risk on an Arctic wide basis to prepare for a range of planned and possible situations we had to do more work to link everything together, ice regime, the Polar Code and Ice Class. We needed to work hard to make that happen. It would not happen in its own.

Essential to this was the gathering of knowledge in an integrated approach and the research community working with industry, Governments and international regulators was seen as critically important.

Slide 65 - Conference on Sustainable Arctic Shipping and Marine Operations – London, March 11th 2014

On 11 March 2014 in London the Swedish Ministry of Foreign Affairs, with the support of the Nordic Council, organised this Seminar about best practice in the Arctic, with heavy input from the insurance market including the P & I Clubs, and ice experts from across the Arctic, including Captain Backman and the 3 subsequent Master of the ODEN. Some of the British and Canadian Delegation of the IMO were also present, and the US Embassy. including Andrew Kendrick form Canada, and Rob Hindley of IACS.

Slide 66 - Bridging the Arctic Marine Risk Gap – The need for a cross Arctic Ice Regime – Lloyd's Adam Room 12th March 2014

LLOYD'S

POLARFORSKNINGS SEKRETARIATET
SWEDISH POLAR RESEARCH SECRETARIAT

Cefor The Nordic Association of Marine Insurers

The Swedish Club

Workshop on

Bridging the Arctic marine risk gap - The need for a cross Arctic Ice Regime – linking ice conditions to ice class requirements

12 March 2014
London – Lloyd's Adam's Room, One Lime Street
London, UK, EC3M 7HA

And on the following day this workshop took place in Lloyd's Adam Room, focusing on the creation of an Arctic-wide ice regime where strong industry recommendations were prepared and were sent to the Arctic Council. I would encourage you to look at those recommendations on the Swedish Polar Research Secretariat Website.

- That the Arctic Council, or its working groups, is asked to assist in setting up a forum for the sharing of knowledge by industry, Government, the Research community and other parties in order to foster best practice
- That under that proposed forum a specific group be set up to build an ice data regime across the Arctic to encourage each member state to take responsibility for their section of the Arctic in order to ensure best practice that goes beyond current regulatory requirements in areas where it is lacking. This is similar to initiatives already in motion in relation to charting.
- That under that forum the issues of crew competence and training be nurtured in a systematic and harmonised way in order to foster and support best practice - similar to training in relation to dynamic positioning such as that provided by the Nautical Institute.
- That the Arctic States come to some agreement about the monitoring of operations outside their Exclusive Economic Zone that constitute international waters.
- That such a forum represents a cross section of interests that make it fit for purpose – operators, insurers, and representative bodies such as the International Association of Classification Societies, with representatives from each member state.
- That such a forum includes a mechanism for sharing of experience in a way that does not compromise competitive advantage, or confidentiality.
- That these recommendations be raised if possible at the meeting of the Senior Arctic Ambassadors, including participation by Mr Koji Sekimizu, at Yellow Knife, Canada, 25-27 March

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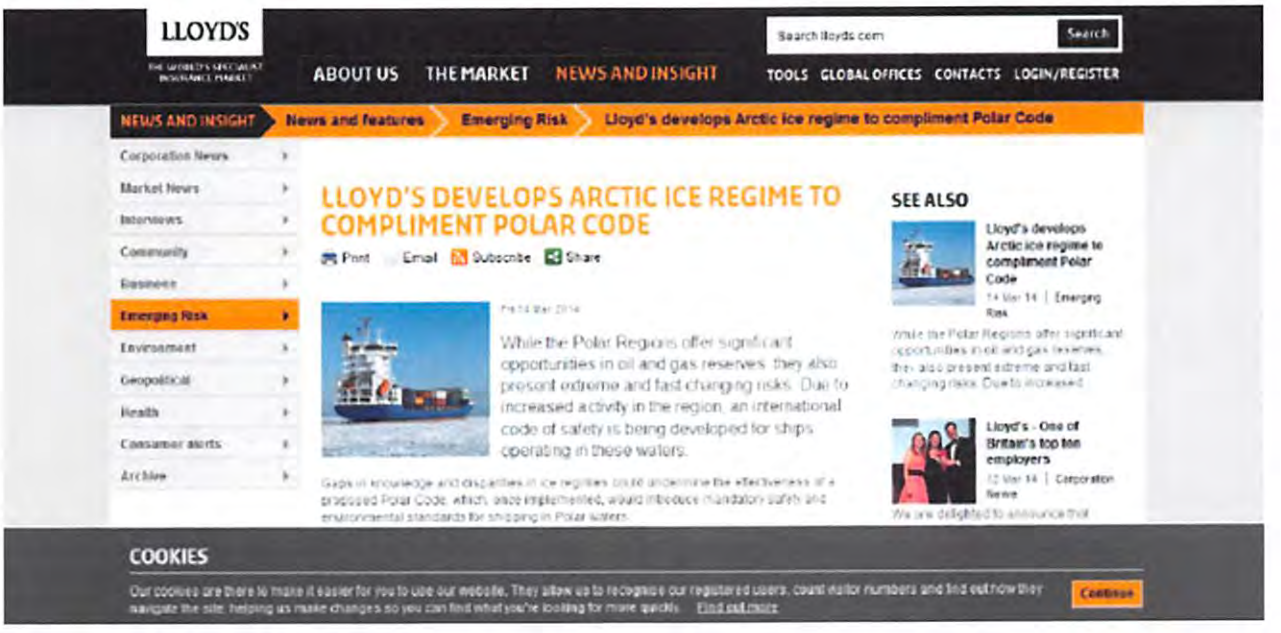
Slide 67 - Progress – Recommendations for an Ice regime and forum for best practice made to the Arctic Council in time for meeting with IMO General Secretary



The IMO's Sec General Mr Koji Sekimizu was present. He then attended the following Arctic Ambassadors meeting in Yellow Knife, Canada in late March, the IMO's first official meeting with the Arctic Council.

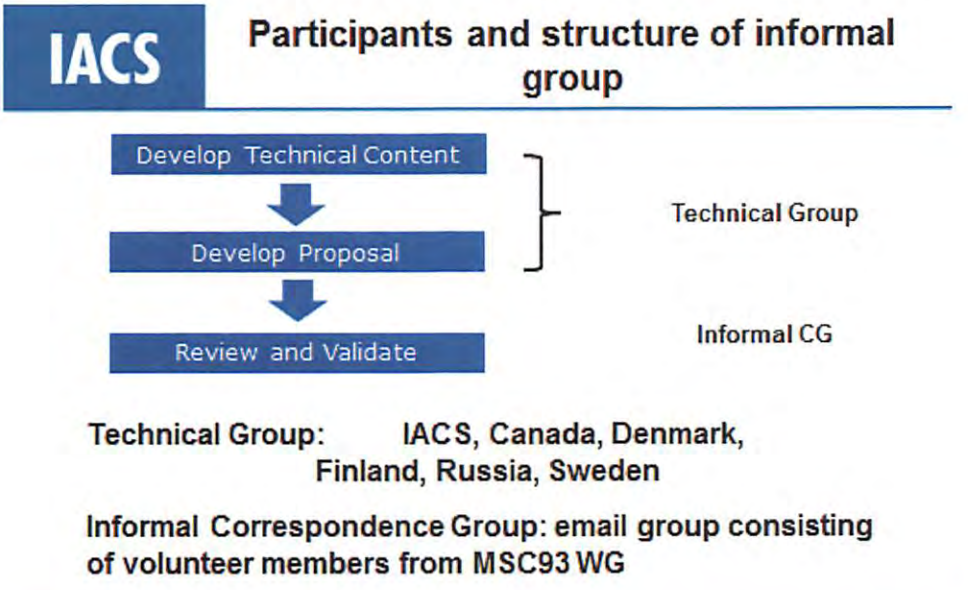
We were working a parallel approach – requesting that the Arctic Council – consisting of the 8 Arctic States, establish a forum for best practice - to create an Arctic wide ice regime based on the recommendations made at the London Workshop to complement the Polar Code.

We did not know if there was, or even think there was, time to include it in the Code.

Slide 68 - Developments in Working Group at MSC93 – June 2014 – 'Arctic wide ice regime developments'

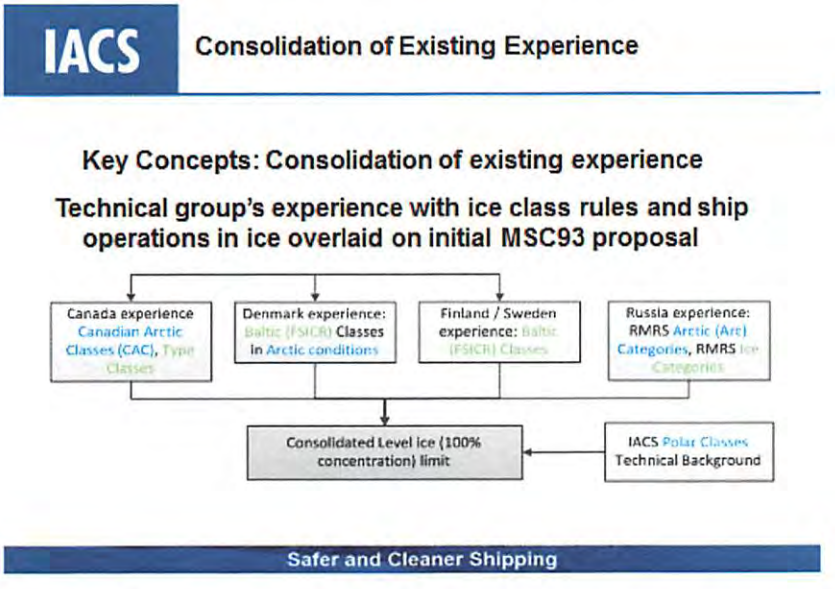
But importantly, great leadership emerged, particularly from Rob Hindley of IACS who attended the London Seminar and Workshop, and James Bond of American Bureau of Shipping, (with a name like that it is no surprise that some serious progress was made!) and following further discussion, at the IMO intercessional meeting about the draft Polar Code, MSC93 in June 2014, the issue of an Ice regime was debated. It was informally agreed that limitations for operating in ice demonstrating a systematic analysis of how the operator has arrived at his / her limitation should be included on the Polar Ship Certificate. The full details should be included in the PWOM. It then had to be done formally and put to the World Delegations – all 170.

Slide 69 - Participants and structure of informal group



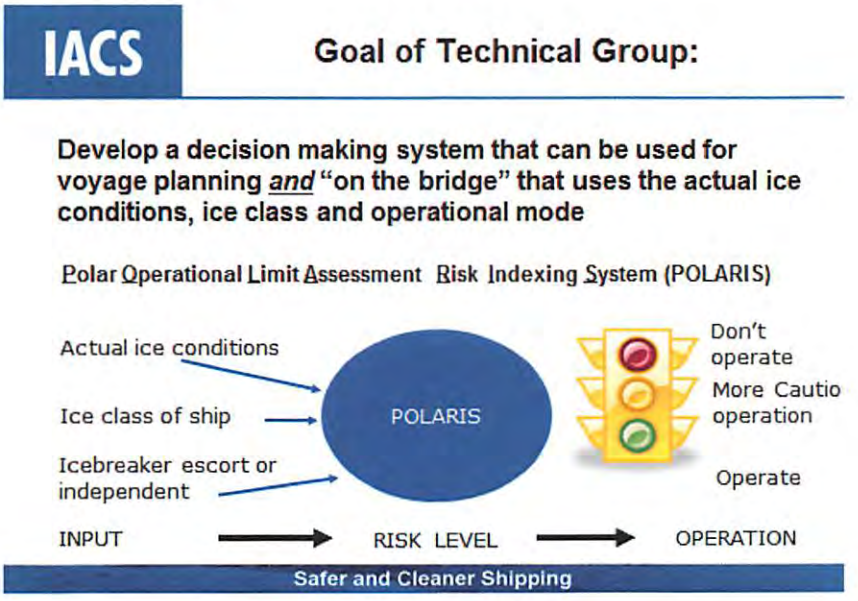
A Technical Group involving most Arctic States was established to link and was set the goal of making recommendations in time for MSC94 in November. The Group also linked in with an informal correspondence group which included all Arctic States and most Antarctic States. Others, such as myself, were working in the background, canvassing for the inclusion of some sort of an ice regime in the Polar Code, working closely with the US Coastguard.

Slide 70 - Consolidation of Existing Experience



The group brought together all the expertise regarding 'ice regime' systems for operation in ice which I mentioned earlier.

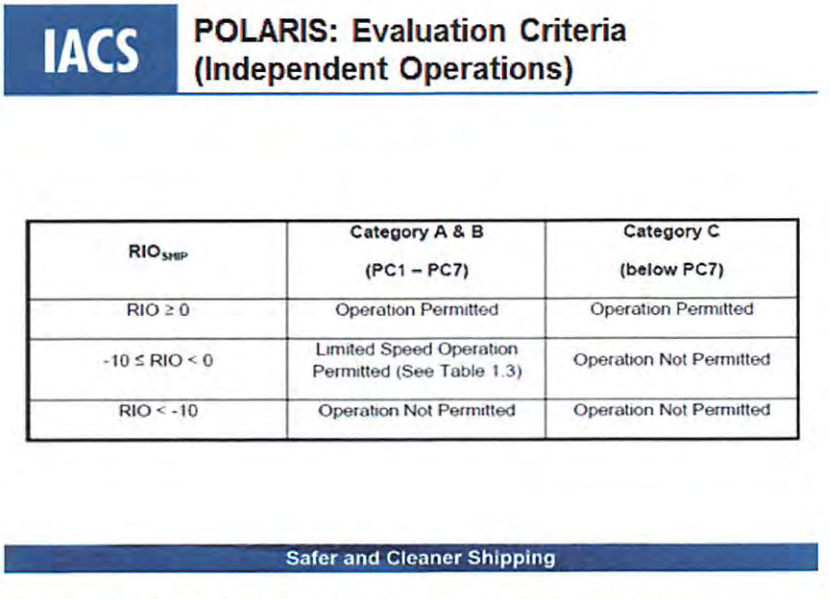
Slide 71 - Goal of Technical Group



The Goal of the Group was to develop a decision making system that can be used for voyage planning and "on the bridge" that uses the actual ice conditions, ice class and operational mode.

A system was developed called POLARIS = Polar Operational Limit Assessment Risk Indexing System (POLARIS).

Slide 72 - POLARIS: Evaluation Criteria



RIO_{SHIP}	Category A & B (PC1 – PC7)	Category C (below PC7)
RIO ≥ 0	Operation Permitted	Operation Permitted
-10 ≤ RIO < 0	Limited Speed Operation Permitted (See Table 1.3)	Operation Not Permitted
RIO < -10	Operation Not Permitted	Operation Not Permitted

The aim of POLARIS is to provide a standard approach for the evaluation of risks to the ship in the ice conditions expected to be encountered by providing a risk index in any geographical area that the ship is intending to travel. This is a system similar to the established Canadian Ice regime, for other ice areas of the Arctic or Antarctic, and

effectively creates a Polar ice regime, drawing also on the very experienced Finnish- Swedish Baltic system, and the Russian system, with heavy input from those jurisdictions.

POLARIS uses a Risk Index Outcome (RIO) value to assess limitations for operation in ice. For each geographical area encountered the Risk Index Values (RV) assigned to the ship, based on the ice class, are used to determine a RIO that forms the basis of the decision to operate or limitation for operation. If the RIO is Zero or Positive the ship can proceed without speed limitation.

Slide 73 - POLARIS: Speed reduction in Negative RIOs

IACS **POLARIS: Speed reduction in Negative RIOs**

Table 1.3 Marginal capability speed limitations

Ship Category (ice class)	Independent Operation Speed (knots)	Escorted Operation Speed (knots)
A (PC1 – PC2)	NA	NA
A (PC3 – PC5)	5 knots	5 knots
B (PC6 – PC7)	3 knots	3 knots
C (IA Super - IA)	NA	3 knots
C (below IA)	NA	NA

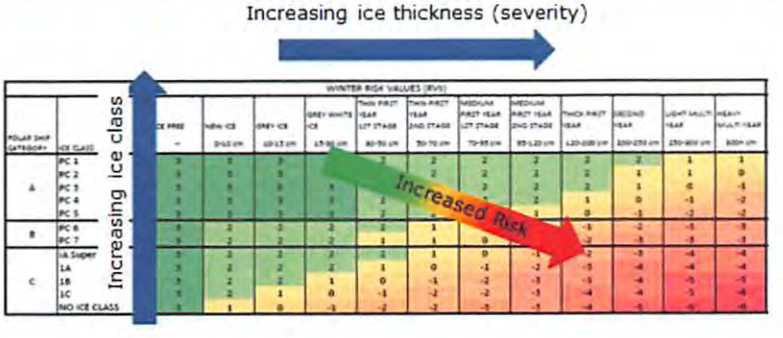
- Acknowledges that there is not a finite point when the ship cannot operate
- Based on IACS ice class rule formulations

Safer and Cleaner Shipping

If the RIO is between -1 and -10 the ship can proceed with speed limitation, such speed is calculated by POLARIS, and if the RIO is below -10 the operator has to demonstrate exception circumstances. There are also provisions for ice areas broken by ice breakers, so ice breaker assistance is taken into account in the calculations. The limitations determined by POLARIS are to be included in the Polar Ship Certificate.

Slide 74 - POLARIS TABLE

IACS **Key Concepts: Partial Ice Concentration Approach**

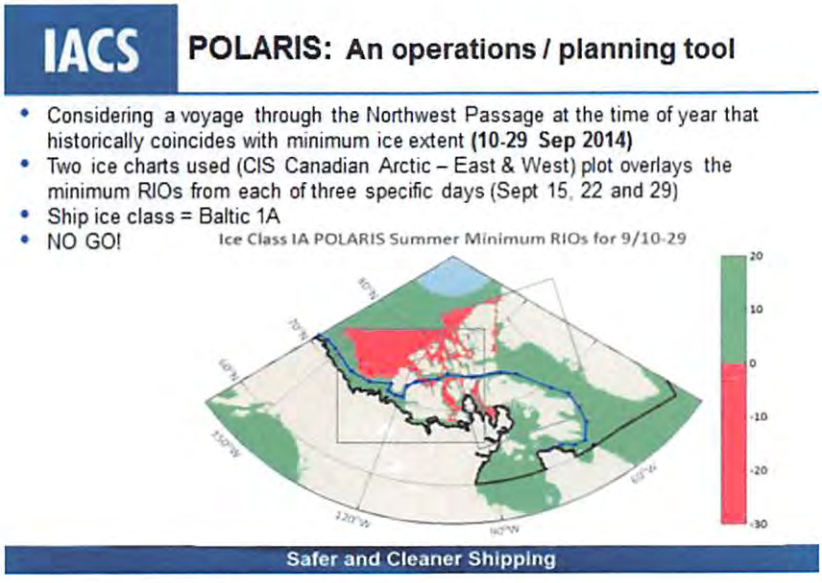


Safer and Cleaner Shipping

And it doesn't take a rocket scientist to work out that the lower the ice class and the harder the ice conditions the likelihood of a no-go increase.

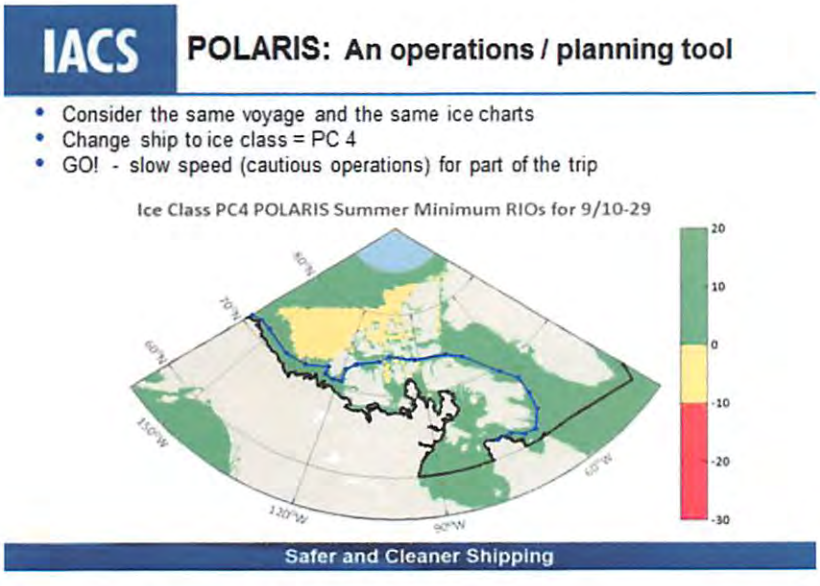
Here are two brief examples:

Slide 75 - Baltic 1A – Northwest Passage



This is a Category B Vessel looking to go through the North West Passage in September 2014. It is a no-go as you can see from the red on the Ice Charts.

Slide 76 - PC4 – North West Passage



Whereas a Category A (PC 4) Vessel can proceed.

The Marine Safety Committee 94 meeting in November was scheduled to be the last Working Group before agreeing the Code – So nothing like leaving it to the last minute after 22 years to get perhaps the most important Part of the Code approved in a few days.

But somehow it was managed. AT MEPC67 in October which discussed the MARPOL environmental amendments, when proceedings had finished the delegations met informally into long evenings to work on POLARIS. A huge amount of canvassing of world delegations, including France, Australia, New Zealand and so on took place before MSC94, which I found myself heavily involved in with the Swedish, Canadian, US delegations and IACS.

And at MSC94 it was formally agreed and inserted in the Code that the operator must confirm on the Polar Ship Certificate that a recognised methodology for operational limitation has been used – the method to be developed by the IMO and the correspondence group was set up to finalise the new methodology, which will be in addition to existing methodologies such as the Canadian AIRS system, the Russian one and the Swedish-Finnish rules in the Baltic. This allows time for practical applications of POLARIS to be carried out to allow the system to be perfected and tables, definitions, and some other technicalities to be agreed. A huge amount of work is going into it with great assistance from a cross-section of industry and organisations in the Polar Regions, including great help from the Cruise Line International Association and other cruise line organisations such as IAATO (The International Association of Antarctic Tour Operators), and AECO – (Association of Arctic Expedition Cruise Operators).

The Correspondence Group is in its final round of submissions and the methodology will be issued as a circular after IMO MSC96.

Slide 77 – Franklin - Education of Industry

I mentioned at the outset that we need to think through properly operations that are planned prior to the introduction of the Polar Code in January 2017.

In August 2016 it is planned to take the Crystal Serenity through the North West Passage with 1000 people or so on board. We heard earlier Tim Keane of Fednav's concerns about remoteness in the North West Passage.

I attended a lecture at the Royal Geographical Society last March with the Canadian High Commission regarding their finding last August of the HMS Erebus, Franklin's ship which disappeared in the North West Passage in 1848. Franklin is revered in history as a hero in glorious defeat.

However, 75 year old Captain Anders Backman, who is one of the most experienced ice Captains in the world says:

"In *my world Franklin does not deserve to be treated like a hero, I would prefer to call him "being regardless of other peoples' lives"*

I said at Lloyd's in April, *"Bearing these comments in mind, and thinking also of the peril we would be in 103 years ago today as we approach Cherbourg on the Titanic, in the absence of any salvage equipment or any ports, the owners of cruise liner Crystal Serenity, I would personally say, will need to do a lot of work to demonstrate how they would prepare a Polar Waters Operation Manual. No doubt they, with Ice Breaker assistance, can apply POLARIS, but what about Search & Rescue? I would be very interested to read the Crystal Serenity's Polar Waters Operation Manual"*

Indeed I still would.

I mentioned at the outset of this talk the importance of educating industry, administrations, and the insurance market about the new Polar Code. That is essential if the system is to work. Operators, Flag States, Port States, and insurers need to understand the POLARIS system and Polar Water Operations Manuals, and if they do then we will have safer operations in the Polar Regions.

Slide 78 - Salvage Risk Forecasting – Arctic

Pre- planning – either for the insurance market, or the operator is very important It makes sense to me to employ professional experts to accurately predict the consequences of the operation in question and how it could go wrong, and what measures to take to mitigate risk, thereby helping operators to fill in their PWOM correctly and present their plans sensibly to Administrations and Insurers. This in turn can help reduce premiums and finance costs and help with clearance from administrations, and Port State Control.

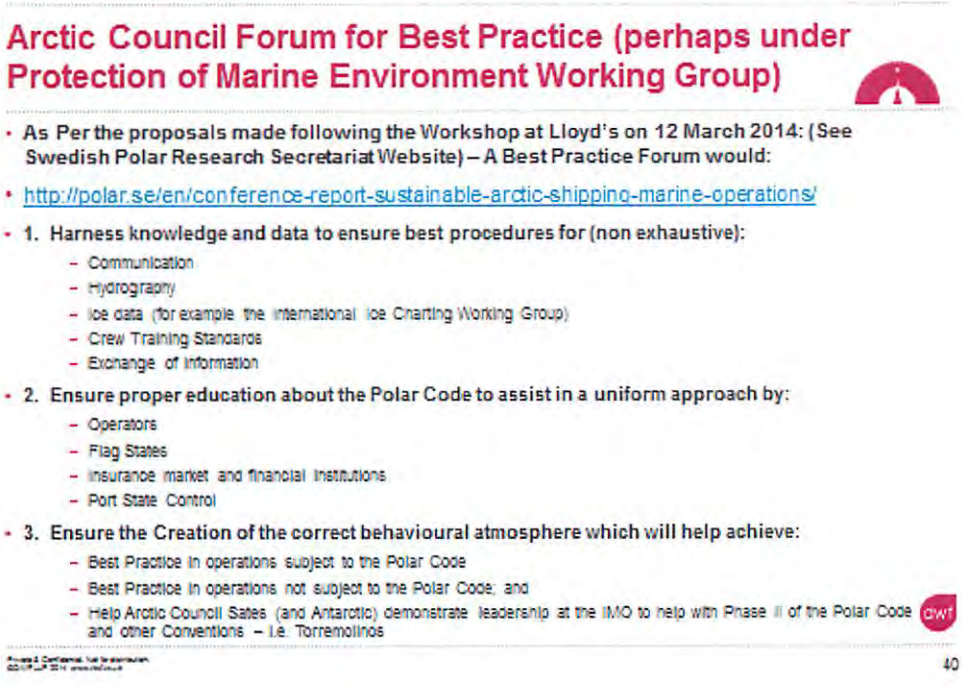
Slide 79 - More Work to –be done – Tragedy in the Bering Sea 31 March 2015.- Non SOLAS Vessels

"More than 50 fishermen feared dead in Bering Sea trawler tragedy"

Nothing happens without extracurricular and voluntary effort. In this instance the insurance market has worked together bringing international regulators, Governments, operators and the research community together to make a significant difference.

In addition to education about the Polar Code, there is a lot of other work to do. Other areas require regulation – the NON – SOLAS vessels in Polar Regions such as fishing vessels, as demonstrated by this awful tragedy last April, and pollution from fixed structures.

Slide 80 – Arctic Council Best Practice



We are still working on the forum for best practice in the Arctic Council and I had very important meetings in Washington D.C in May and July to help establish this under the US Chairmanship. I also had an important meeting with Captain Barata in USCG HQ in Washington D.C just on Monday. That work in parallel to the Polar Code continues. It was great to see that the co-operation between the IMO and the Arctic Council escalating rapidly with a joint Conference in August in Malmo in conjunction with the World Maritime University, where I presented the Best Practice Forum concept to focus on hydrography, communication, and ice charting which equates to Navigational safety, a priority under the US Arctic Council Chairmanship in a forum that was chaired by Jeff Lantz.

The Swedish seminar and the results in relation to the ice regime System- POLARIS – are an example of what such a forum can achieve, which will help to educate everyone about the Polar Code, and really focus on the tools to make it work – best practice in crew training, hydrography, communication, and ice charting. This will help to educate all the stages of the process – Operators, Flag States, Insurers and Financial Institutions, and Port State Control.

Who knows, but a push for phase 2 of the Polar code for non SOLAS ships may help to influence the ratification of the Torremolinos Convention to deal with these fishing vessel issues elsewhere in the world.

And I am delighted that I received a formal request form the Arctic Council last Friday to present this concept formally to the Arctic Council PAME Working Group on 01 February 2015.

Slide 81 – Learning from the lessons of history – Helping the IMO to prevent disaster

Whilst there is a lot of work to do, our work thus far on the Polar Code will have protect some people and the environment from the usual disasters, and perhaps may have created some more momentum, proving that **TOGETHER** in an integrated approach **WE CAN MAKE A DIFFERENCE**.

Slide 82 – Happy Insurers – if we work to make the necessary advances

Polar Code
+
Ice Regime
+
Best Practice
=
Insurance
=
Trade and Investment
=
Sustainable Arctic Development

And on a practical business level if we get it right it is possible to have happy insurers who will insure Arctic operations that are based on a sustainable approach to Arctic development so that everyone benefits.

Many lessons in best practice and working with industry can be drawn from the International Ice patrol, which is why it is so great to be here, and I thank you again Commander McGrath. The work you do and the overall work of

the United States Coastguard is phenomenal. You are the Angels of the Sea, the Miracles on the Horizon, and it is truly an honour to be asked here to do this talk.

Slide 83 – Acknowledgement Slide

- In preparing this presentation I would like to sincerely thank the following for their great assistance with content and slides. I would also like to acknowledge their very hard work on best practice in the Arctic and on the Polar Code:
- **CMDR Gabrielle McGrath – Commanding Officer – International Ice Patrol**;
- **Captain John Mauger – Commanding Officer – USCG Maritime Safety Center**
- **Andrew Kendrick – Vard Marine** (member of Canadian IMO Delegation);
- **Tim Keane – Fednav** (Member of Canadian IMO Delegation);
- **Rob Hindley – Lloyd's Register** Arctic Lead, and International Association of Classification Societies representative at the IMO on the Polar Code;
- **Dr Heike Deggim**, Senior Deputy Director, Marine Environment Division, **International Maritime Organisation**;
- **Mikael Anzen – Swedish Ministry of Foreign Affairs**;
- **Vanessa Escobar**, Missions Application Deputy Coordinator, **NASSA**;
- **Ake Rohlén**, **Arctic Marine Solutions**;and
- **Captain Anders Backman**;

Thank you very much.

Michael Kingston
Marine Trade & Energy Group, DWF LLP
michael.kingston@dwf.co.uk

International Ice Patrol
New London, 10 December 2015